

AVIATION

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AVIATION AND AIRCRAFT JOURNAL

FEBRUARY 7, 1932

No. 6

Aircraft vs. Capital Ships

THE following remarkable discussion of aircraft versus battleship was sent to AVIATION AND AIRCRAFT JOURNAL by C. G. Gray, the distinguished editor of THE AIRPLANE. It was written on January 24, before General Mitchell's statement on the same subject was made in Washington.

I am glad to see that you are interested in the subject of Aircraft versus Capital Ships. Heretofore, my personal opinion is that the capital ship of the future will be a very big high-speed aircraft-carrier which will use torpedo airplanes instead of long range guns, and otherwise will be composed with what is now known as the necessary equipment for aerial bombardment and aerial bombardment. She will also have to carry flying squadrons to repel torpedo droppers.

Boats dropping against ships is heretical as compared with torpedo droppers. Think of the number of errors which a boat drops over one another. A torpedo dropper on the other hand, has got to worry about avoiding another torpedo. The torpedo, itself, is often after another torpedo in the rear of the water. The speed of the torpedo hardly matters in the lead, as the only thing the point has in think about is the speed of the vessel which he is going to torpedo and the distance she will cover in the time his torpedo will take to reach her. And, as he probably has 300 feet of fast fire for length, he has a pretty wide margin for error. The errors of the boat are multiplied many times over as the range is limited not by the gun but by the limit of, by the curve of the earth (i.e., the horizon), and by the atmosphere which prevails, prevailing at the moment.

Again from that, the naval power is not dead as about the most efficient in the world. I think it is pretty generally admitted that the building of the U. S. Navy has been a waste of money, but the U. S. Navy is not the only one that has the Navy. In the German had had a fleet of 60 or 72 per cent, at least as far as I judged they would supply have known as not of the water over superior gunnery.

Even the British naval gunnery is not bad, as naval gunnery goes, but compared with the aerial antiaircraft gunnery of the U. S. Navy, it is not good. The British gunnery is known only by the efficiency of its anti-aircraft artillery which was underfunded for the field artilleries or the gunnery gunners. What has does for know anything about the completely new science of aerial gunnery as developed by the anti-aircraft gunners in the London Air Defense Area during the war. Consequently the British's guns are taken away from it and re-purposed for the ground forces who do know something about them with the terrain for the job.

What is really at the bottom of the bad naval gunnery is the fact that the naval gunner shoots pretty or sight at a target on his own level and consequently converts his rounds. The aerial antiaircraft has to shoot at targets anywhere above him or below him and as often as not has to fire by the map rather than by what he is doing or not. That is why the Army is more successful.

Finally, upon aerial aviation, did you see the statement that in an attack by, I think it was eight, airplanes carrying explosives on the British fleet anchored in Portland Roads the airplanes missed our fleet late, made a wide circle and held out to the British fleet and drop a bomb which exploded just outside of the fleet. The explosives came over from Germany near Pernisberg, preceded by two bombers which flew at about 10,000 feet when, of course, the flat-bottomed sailor man sailor heard our saw them. Instead of dropping bombs the sailors dropped a string of water-bombs about a mile to

windward of the fleet. Before the smoke cleared away and before the fleet had a chance to see a gun, the torpedoes machine gunned through the smoke and went in about 150 miles an hour, so that the sailors lost just that much time to get out of the way but had a chance of hitting any of them. It is perfectly certain that given an adequate force of torpedo aircraft on hostile fleet could get within 100 miles of any coast as defended.

Aircraft Union Stations

THE establishment of a flying field in Los Angeles for use of all aircraft companies operating anywhere in the vicinity is the beginning of a logical development that will spread to all other unincorporated aviation developments. Probably the greatest stumbling block in the way of economic progress in the lack of general cooperation in all its branches. If a company is required to buy and equip every flying field that it needs to run an service the proposition becomes too big for any ordinary organization to handle. In addition, after that company is in operation, a second company may wish to serve some of the same areas. This second company would be forced to either pay a high rent to a competitor or establish another field of its own. Providing two fields where one would be an economic waste.

Flying fields should logically be established and maintained by the state or municipality in the same manner that land and water highways are now maintained, without precluding private construction. This has been the policy of the Air Mail as far as possible. Many incorporated fields have been established to attend the road. The reason for public flying fields lies in the fact that it is of paramount interest to the state that flying fields be established all over the country for reasons of national defense and commercial advancement.

The presence of proper and uniform national regulations governing the operation of aircraft is also essential. Flying fields are respectively needed for their value would be more what voluntary by a lack of traffic regulations and by balancing among the users of the fields as in their respective rights due to a lack of proper control.

Air Tournaments

CALIFORNIA has pointed the way in the successful method of conducting an air tournament. When that thousand people will go to a field and witness a tournament and one hundred thousand go to the vicinity to see a few show, it is clear evidence that air meets have an intrinsic value that is immensely deserving such publicity and recognition.

The exhibition nature of such tournaments, where the public may witness suspended with various types of aircraft is helpful to the Army and Navy and deserves their encouragement.

If sufficient local support can be assured it is planned to have several such tournaments in other parts of the country this year.

Economy and Aerial Defense

Aeronautics Has Introduced a New Element into Warfare and Has Carried Warfare Into a New Element.

"We've reached the epoch-prologues in its advent—when positively the air commands and dominates both land and the water."—Lord Fisher

"The Army that will serve the navy will be that army that is the newest, the most sudden and most terrible—the aeronauts."—Marshall Foch

"The battleship is dead. The future is with the aeroplane."—Admiral Sir Percy Scott

One battleship with its necessary tenders and complete armament costs from \$60,000,000 to \$40,000,000. The latest proposal is to save \$6,000,000 for aerial construction for the Air Service. For example, if one-tenth the cost of a battleship, the "economy" of expenditure in view of the editorial comment of Admiral and Aeroplane agrees in against the last advice of those whose positions do not require them to follow departmental policy.

The Big Ship Controversy

[From *Flight* (London) January 8, 1922]

"We have naturally followed the conference referring to the future of our naval shipbuilding policy with more than a little interest. The news as we read the news are we intended of the previous session that the navy was to be increased by the power of a battleship. It is passionately urgent for the Navy to arrive at something like a settled system after perhaps the colleagues of past years are committed to the dusty prior by distinguished retired admirals and senior officers of the Navy, and the naval service appears to have been open and courageous of how the future would be decided and won."

The scope of it all is, from the point of view of the naval side who strives for enlightenment, that every little bit made seems to mark of special phrasing, an impression which is very often strengthened when the record of the writer is looked at. It is found that he is a distinguished specialist in the particular branch of the service which he apparently prescribes. Naturally, it is my opinion that should we ask the submarine specialist to advise that the future of naval war lies in the hands of the big ships. Nor is it logical to expect an officer whose principal service has been as a battleship to agree with the school which asserts that the big ships are to be superseded by the submarine, the submarine, and indeed even eventually by the aerial armament of the naval vulnerability to attack by high-speed-carrying aircraft.

Hence the only way to arrive at conclusions is by careful research and weighing of all that is said on every aspect of the question, and a careful disputation of all that seems based by the naval school which is the school of the majority. The tendency we have in mind is well described in the following extract, in which Admiral S. B. Hall draws attention to a letter to *The Times*, that the conference has largely been reduced to a discussion of the respective merits of the battle-ship and the aeroplane. "The share which aeroplane is likely to take in the naval future, in the future, he points out, is agreed or discussed with little more than a reference." Admiral Hall,

after passing his faith to "thoroughly efficient air, submarine and mining aeroplanes," concludes his views with the following pronouncement: "It is air mastery alone that can give us the power of a superior influence."

Colonel Brewster sums up the case quite well when he says to the *Times*: "France, after reviewing the classes made by all sides, "thoroughly convinced that the future of the battle ship is to destroy the enemy's sea bases, coasting stations and commercial harbors, and others have concluded that submarines have rendered such enterprises impossible. They will not be impossible to aircraft, and I am certain that the Air Force must henceforth par excellence the arm of offence against the submarine, the submarine, the big ship, addressed to the Air service, the submarine, the Navy sufficient for the construction of capital ships, then they would go. We nation can neglect power in the air as under no circumstances do we have in the airship."

Naturally, the aeroplane very naturally, the endorsement of Admiral Hall's and of General Brewster's views, and believe that before many decades these will be facts who will be of the same way of thinking.

In the way of a last "view" of the future the following extract, from the *Times* Year's article on the German paper, *Die Römer*, should give some idea of the situation.

"The rapidity of change to submarine marks a new era in the way of warfare which is of the highest importance. It can never again be left out of consideration, any more than the majority of the air armada and aeroplane."

It would seem reasonable to say that this writer has not arrived at a stage when he has had time to fully consider the matter, capable of solving the whole of the question, the first from professional bias, and qualified to arrive at balanced conclusions, which must be formed upon the professional sources, whether they agree with these conclusions or not.

The Navy Building Program

[From *The New York Tribune*, January 27, 1922]

The policy of building battle-ships and cruisers by the Navy was under consideration by Congress. A wise decision is of vital interest to the country. There are eleven super-dreadnoughts under construction.

Two of these, the *California* and the *Maryland*, are an anachronism that they should be added to the fleet. The *Californias*, the *Washingtons* and the *West Virginias* are well advanced. These three, with the *Maryland*, would form a strong

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division of 16-inch-gun ships. Their completion may be delayed.

The remaining six dreadnoughts are less than 25 per cent complete. In view of the cost of battle-ships of present type, these vaporous and air-ship-like ships, when completed, the ships may be very useless. It would seem sound policy to stop work on them for the present. It may be necessary in view of the Japanese expansion to provide them with anti-aircraft decks to protect them from bombing attack. Or if they are to be maintained as they are, it may be advisable to reduce their size to 35 knots and to carry ten torpedo planes and twenty fighting planes, as a capital ship and is thus powerful as an efficient weapon than any other type of capital ship can be.

It is sound for the big ship program. There are ten aircraft carriers now in the service of the admiralty. The naval air-crafts are expected regardless of the battle-ship policy. We need some fast surface ships in the fleet.

It is manifest that the forty-year-old admiralties are fully satisfied. There are no modern admiralties in our fleet today. We will have one or two battleships without them.

There are but one or two battleships without them. We must not be satisfied with a navy that would have been strong in 1922 and in the years to come. Congress should immediately appoint a committee to investigate this subject thoroughly, and the committee should call officers to testify frankly and freely. By doing this we may save hundreds of millions in providing a modern three-plate navy.

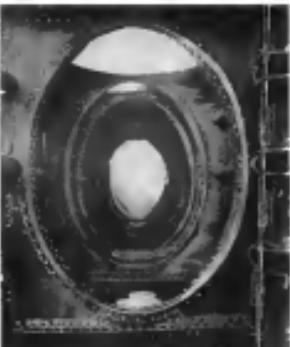
The Zeppelin Staaken Airplane

Three views of the Staaken-Dorpatian monoplane are shown herewith. That is one of the few ships which the International Commission of Control has allowed the Germans

airship side is used to take the bulk of the vertical load and the shock absorbers are part of these vertical load struts. There are thus but four other struts used for the chassis.



VIEWS OF THE STAAKEN DORPATIAN AIRPLANE: IN FRONT, REAR, AND SECTION THROUGH THE ENGINE NACELLE.



FRONT, REAR, AND SECTION THROUGH THE ENGINE NACELLE.

is proceed with. This machine has made a dozen test flights and is being put into final shape.

It is interesting to note that while the monoplane structure is good, it is not internally braced, lift wings being used for flying load, while for inverted loads the wing takes care of itself.

One of the interesting features of this machine is the remarkably clean chassis. Apparently the one heavy strut on

the struts are about an horsepower 160-hp and the engine itself is over 100-hp and is to take the required load on the chassis in existing conditions. Previously covered ponds are provided at either end of these latter struts. On first the landing gear proved insufficiently strong, for it gave way on landing.

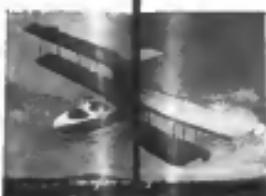
It is understood that the construction of the machine is such that a machine can make his way in the engine

Every wide awake pilot can make money this year. You can buy a six passenger Aeromarine Navy HS-2 Flying Boat equipped with 350 HP. low compression Liberty motor for one-third of what it would now cost to build it. Your operating cost for fuel, pilot and mechanic is \$16.00 per flying hour. Your possible revenue is from \$250.00 to \$300.00 per flying hour. This shows a handsome profit, after allowing fully for overhead and depreciation.

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tons of steel. A Trans-Ocean testing machine can exert a load of 30,000 pounds maximum and take a strain 4 feet 6 inches in compression and a load equivalent to 6 feet 6 inches in tension.

The plant also includes a motorized horizontal furnace from Elmer & Morris, New York, which is mounted on the building so that one set of coils can be replaced without the furnace being put out of commission.

A very interesting item is a sample apparatus for experiments in flight research. A small Biplane former under a wire-

mesh cover has a clear floor space of about 100 x 100 feet. In connection with the wind tunnel a large dry kiln is in operation.

Wood Shop

The tool shop or a room 200 feet long by 60 feet wide has a hand clearance of 18 feet. The floor space is entirely clear. Paint and varnish stock rooms are placed on the floor at the corner of the shop. In the upstairs galleries are the



THE AIRCRAFT HALL SHOP. THE CONSTRUCTION, FORMS ARE SET UP ON THE LEFT. THE WOOD MILLS AND GLASS PRESS. THE PLATING ROOM

huts is provided at which a temperature of 900 deg F can be obtained in 30 minutes, and experiments in the heat treatment of aluminum are now under way.

Wood Shop

The wood mill is particularly well and completely equipped for every kind of wood work which is likely to occur in the aircraft industry. A stock of 10,000 pieces of wood for laminated wood houses, as can be seen in the photograph. Some of the machines include a sawing machine from T. A. Fay & Sons Co., Cincinnati and a mechanical applying wood paper machine of the Matson Wood Papering Co., Beloit, Wis. An interesting piece of equipment in the Matson automatic strip sawing machine is a straight line saw which is a rectangular strip of wood with a pre-set camber, about 1000 strike a day to be shaped. The American Woodworking Machine Co., Wilkes-Barre, Pa., provides some of the hand saws, horizontal planers and similar machines.

timber shapes. Holes are bored oversize in them, which are essential to quantity production and uniformity of manufacture.

Adjoining the boat shop is the curving department. A shop in which the end of the boat shop has all parts and frames built to shape and numbered ready for assembly. The complete hull is taken out directly from the boat shop to the dock as quickly.

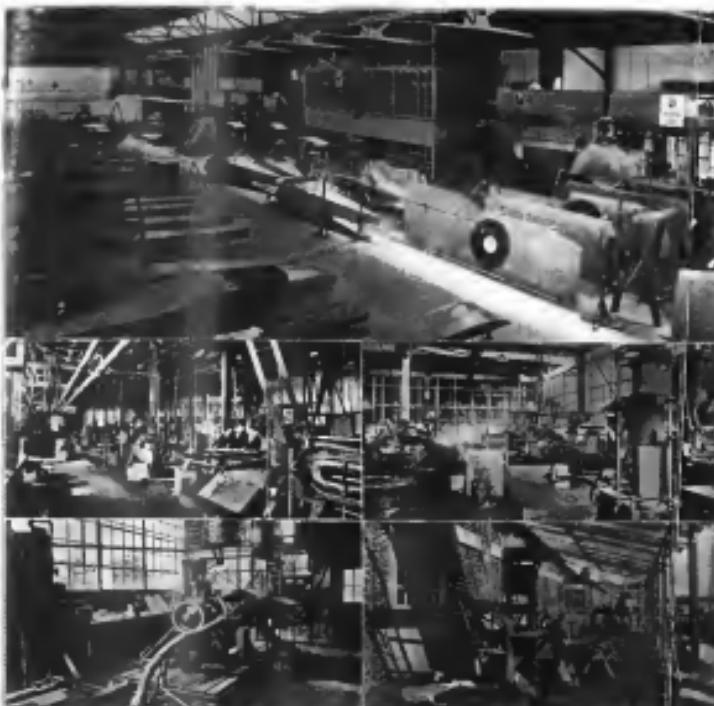
Plating Department

One of the most important parts of the equipment of an airplane factory is the plating room for metal parts, such as fittings, structural parts, etc. The plating room of the American Metal Co. includes a bath with a maximum length of 18 feet, built solidly into the ground, where all plating can be carried out in accordance with Army and Navy specifications.

There is a self contained generator set and a switchboard allowing for fast regulation of the current. Two rotary platen, one of which is shown in the extreme left of the photograph, are supplied by Hanson and VanWinkle Co., Newark, N. J. The center plates are extremely efficient for small parts.

Final Assembly Room

The final aircraft assembly in a heatedly lighted, ventilated and heated room some 200 feet long by 80 feet wide with a 30-



THE FINAL AIRCRAFT ASSEMBLY ROOM IN THE AEROMARINE FACTORY
A VIEW OF THE MACHINE SHOP, MOTOR DEPARTMENT,
THE DRYING-OUT ROOM

Welding Department

The welding department includes a barrel and blast machine, electric arc welding machine, a dip heating outfit, and a Thompson spot welder, used for spot welding before furnace heating. A heat treatment furnace with a ten-foot length limit is also part of the equipment. In connection with this

foot clearance to the roof truss light and load. It carries single galleries on three sides, which constitute storage space for finished and surplus parts, as well as the particularly well located finished parts stock room shown in the back center of the illustration.

At the end of the shop there are sliding doors with 40 to 48

feet clearance to the roof truss light and load. It carries single galleries on three sides, which constitute storage space for finished and surplus parts, as well as the particularly well located finished parts stock room shown in the back center of the illustration.

foot clearance, so that a machine as large as an F-5-L can be taken out on a roller truck and launched right at the factory door without a single difficulty. One of the reasons is that for a long time for fast assembly of the aircraft aircraft. Six of these F-5-L flying boats have already been supplied for commercial flying purposes. One is ready for delivery, one is under construction and two are contemplated. One plane of this type is equivalent to five planes of the DH type.

Propeller Department

A special propeller department is maintained in the plant and all propellers are designed and built at the factory. No cutting machines are employed, all propellers are cut-out-to-fit to meet exact requirements. The total full equipment is unusual.

Machinist Shop and Motor Department

The machine shop equipment is necessarily large to facilitate the manufacture of the four types of motors produced by the company as is shown by the photographs distributed. The manufacture of such a shop is of great advantage to the aircraft division and with a large and varied machine shop equipment is utilized over broad in the average aircraft factory.

Among the equipment are a number of grinding machines of various types including a disk grinder with a grinding wheel approximately five feet in diameter, manufactured by the Clark H. Reid Co., Chicago, Ill.; a cylinder sleeve grinder built by the Bryant Cylinder Grinder Co., Springfield, Vt.; and a crankshaft grinder furnished by the Leland Tool Co., Waynesboro, Pa. There are also several other smaller types of machines for various purposes.

The lathe equipment is particularly complete, there being a crankshaft lathe of the heavy duty type built by the H. K. Brind Machine Tool Co., Cincinnati, Ohio, and other engine lathe built by the American Tool Works, Cincinnati, Ohio. Milling machines of various sizes are furnished by the Cessna and Shilling Machine Co., Cincinnati, Ohio, Van Norman Machine Co., Haverhill, Mass., and the largest type surface built by Clark H. Reid Co., Chicago, Ill.

For the metal parts are built on Grindley automatics built by the National Metal Co., Cleveland, Ohio, and for larger bar and sheet metal shop equipment are associated with the same manufacturers as above.

A completely equipped tool crib with metal racks manufactured by the Lyon Metals Mfg. Co., Akron, Ill., which is also used for a finished and rough parts shop room, contains a complete assortment of cutters, special tools, jigs, and fixtures, needed for aircraft and quantity production. Panels pressure working from a 300,000 pound machine by various shopkeeping machines are used to avoid hand work on sheet metal parts production.

Water Testing Laboratory

The water testing laboratory is exceptionally complete, the building being separated from the main plant and containing a fluorimeter laboratory and two small assembly rooms.

The fluorimeter is used for the analysis of water and horsepower capacity. This equipment is used for the analysis of water content when incendiary horsepower results, fuel consumption and other tests are desired. The outside test pit, pump, pump at the rear of the test laboratory building consists of torque stands required to perform standard Army and Navy tests and other trials of long duration.

An accuracy test bench of an unusual type is used for speed and the gear on the rear. The usual accurate time measurements in each test are available.

Courtesy Extended on Free

Thanks are due to the general manager, the chief engineer, and staff for facilities offered on a visit to the factory of which the Fairchild and Martin Co. may be particularly proud of and justify the Armstrong claim that they are attacking the commercial aviation problem by personal performance rather than by theoretical speculation.

U. S. Imports and Exports of Aircraft

Years Ending June 30, 1923-1924

Previous to 1922, when the classification "airplanes" first appears, aircraft were included in the class "all other aircraft" and were not separately shown in the statistics. In 1922 there were any importations of these commodities they would be included in the classification of the paragraph of the tariff law under which the import duty was assessed, according to the unit value of component materials such as iron and steel and other metal, or manufactures of wood, fiber or soft.

Passenger will recall we have imports of balloons in 1920.

For the introduced balloons since, the aerostats were brought under heading which is the same as the importation after the word "aeronautic" and dirigible balloons are to be dutiable as imports according to the component material of chief value.

In the statistics they would be included to the class of aeronautic material.

In exports, they would be included in the class "All other articles."

Imports for the American Expeditionary Force showed what were shipped overseas in Army or Navy transports were not included in the official statistics of exports to the United States. For the reason that these exports are not required to enter and clear, and collection of customs fees, otherwise, as regard of the exports of such vessels.

Military supplies and material sold to the allied governments, food-stuffs, clothing and other relief supplies shipped abroad by the Food Administration and the Red Cross were mostly carried on commercial vessels and are included in the official exports of exports. Vessels operated by the United States Shipping Board, either directly or under charter, enter and clear at the custom houses, and their cargoes are included in the statistics.

Exports	Imports				
	Parts of aeronautic material, etc.		Parts of aeronautic material, etc.		
Articles	Value	Value	Articles	Value	Value
1923	\$ 4,154,000		17	\$ 20,714	
1924	\$ 9,202,500	\$ 25,500	18	\$ 60,000	\$ 2,070
	1,000,000			1,000,000	
	1,000,000		1	2,000	
	1,000,000		2	2,000	
	1,000,000		3	2,000	
	1,000,000		4	2,000	
	1,000,000		5	2,000	
	1,000,000		6	2,000	
	1,000,000		7	2,000	
	1,000,000		8	2,000	
	1,000,000		9	2,000	
	1,000,000		10	2,000	
	1,000,000		11	2,000	
	1,000,000		12	2,000	
	1,000,000		13	2,000	
	1,000,000		14	2,000	
	1,000,000		15	2,000	
	1,000,000		16	2,000	
	1,000,000		17	2,000	
	1,000,000		18	2,000	
	1,000,000		19	2,000	
	1,000,000		20	2,000	
	1,000,000		21	2,000	
	1,000,000		22	2,000	
	1,000,000		23	2,000	
	1,000,000		24	2,000	
	1,000,000		25	2,000	
	1,000,000		26	2,000	
	1,000,000		27	2,000	
	1,000,000		28	2,000	
	1,000,000		29	2,000	
	1,000,000		30	2,000	
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	1,000,000		47	2,000	
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	1,000,000		49	2,000	
	1,000,000		50	2,000	
	1,000,000		51	2,000	
	1,000,000		52	2,000	
	1,000,000		53	2,000	
	1,000,000		54	2,000	
	1,000,000		55	2,000	
	1,000,000		56	2,000	
	1,000,000		57	2,000	
	1,000,000		58	2,000	
	1,000,000		59	2,000	
	1,000,000		60	2,000	
	1,000,000		61	2,000	
	1,000,000		62	2,000	
	1,000,000		63	2,000	
	1,000,000		64	2,000	
	1,000,000		65	2,000	
	1,000,000		66	2,000	
	1,000,000		67	2,000	
	1,000,000		68	2,000	
	1,000,000		69	2,000	
	1,000,000		70	2,000	
	1,000,000		71	2,000	
	1,000,000		72	2,000	
	1,000,000		73	2,000	
	1,000,000		74	2,000	
	1,000,000		75	2,000	
	1,000,000		76	2,000	
	1,000,000		77	2,000	
	1,000,000		78	2,000	
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Western Airline Syndicate

The announcement comes from the Canadian Aircraft Co. that C. E. Lay, formerly general manager of the company, when still retaining his connection with that concern, is reorganizing a short line of aviation, which he is to head, that of the Western Airline Syndicate.

During the past season Mr. Lay has operated eight planes in passenger and exhibition work. The planes, which are said to have done almost continuous service, have traveled thousands of miles, entirely without accident. Mr. Lay's organization, however, is to be operating his planes largely to the fact that he has deliberately made use of the Western Airline's respects of flying conditions. His planes have kept constantly posted on weather conditions and were under orders to move their planes in time to locate them in a town where flying weather prevailed.

In six weeks a few days ago Mr. Lay stated that he considered the Western Airline Syndicate flight and passenger carrier "Brimstone" virtually at an end. "What the people want now is regularly scheduled airline service. I do not consider that it is a basis yet for a full fledged passenger service by air," he said. "We must begin with a flight service and gradually develop the passenger carrying planes as the present equipment will not give us the service we want. We are not in a position to do much at this time as the engine development something for us, and until that time the passenger will have to be content at low speed rate."

"I shall endeavor to establish our base on the less hazardous flying territory, reaching the greatest centers of population offering the shortest flights. These express lines will have an advantage in operation over passenger aircraft, so that there will be less wear and tear on aircraft as we will be able to concentrate on landing and take-offs, so as to throttle down our expenses while on the air and save them a great deal. We will not use overhead all around."

The first step in the detailed work of getting the Western Airline organization started was begun in the several cities on November 28, when M. H. Field, business manager, started soliciting business, men to serve on the executive board, that will be available for the organization, and mapping the route lines. Chief engineer Witherup, together with Leo Sherry, vice-president, are making an extensive trip through the middle west covering numerous cities for a factory and tool funds which have been subscribed by individual agents of the several interests.

Nothing definite has been accomplished along this line, but it is said that an organization has been organized near Chicago, and a two cycle engine has been developed and tried out. This engine develops 150 horsepower replacing in the same equipment the present 80 horsepower power plant. Several changes will also be made on the fuselage to admit the carrying of a greater load.

Dugan's Flying School

The Ralph C. Dugan School of Flight and Commercial Aviation Co. has increased its organization to \$30,000 in order to carry on commercial aviation on an enlarged scale. Important changes are being made at the Dugan's Aerodrome in Chicago including the installation of a wireless station for both telegraph and telephone, and the addition of a radio transmitter to be used for flying courses for the students. These courses will contain a large and dormitory equipped with comfortable beds, a dining room, shower baths, a library and convenience to make the life of the student comfortable.

Several new courses have been added to the curriculum. The present course consists of engine instruction, aerial dispensing, aerobatics, aeronautics, truck load shunting, flying, etc. The plane work consists of flying, aerial dispensing, dispensing, aerial photography, aerial aerial work, water-skiing, etc. A course in aerial navigation, instruments, field management and general orientation is also included.

Lectures and class-room work will be carried on during the middle of the day while the flying instruction will be given in the early morning and in the afternoon. Canadian and American planes are used for instruction, while work is given on three types of engines, the vertical, the V-type and the rotary. During the past season this school graduated thirty-two pilots.

Aviation Activities in Portland, Ore.

With three aviation schools well established, a factory for assembling airplanes now in operation and two airports open after flying instruction, Portland has already assumed a prominent place in the aviation center of the northwest.

The first important move for the development of aviation there was over a year ago, when a number of prominent business men of the city organized the Oregon, Washington and Idaho Aeroplane Co. The Lewis & Clark field was laid out and the first flight made by a machine of the company occurred on September 4, 1924.

From that beginning, aviation rapidly developed as a feature of the life of the city. Other airports were organized or came to the city. The city flying field, now known as Roosevelt Flying Field, was laid out and fields were established at various other points in the state.

The Dudley Aeroplane company was the first to use the possibilities in an educational institution for the teaching of flying. The result was that the first school of aeronautics was established and a machine erected on Broadfield Field, containing shops and lecture rooms and equipment for teaching flying.

From this the work of teaching aviation in the city has rapidly developed. In addition to the Dudley school, the Oregon, Washington and Idaho Aeroplane Co. is now maintaining a school and the Adcox auto and gas engine school has maintained a department for teaching the mechanics of airplanes as well as the mechanics of auto and gas engines. An enrollment of over 100 pupils and there is developing throughout the northwest a growing interest in this line of work.

The course in aviation given students in complete. The Adcox school specializes in engines and their construction and repair, the Oregon, Washington and Idaho company's school and the Dudley school take up with the construction of planes and engines and aircraft flying. The Adcox school also has an agreement with the Oregon, Washington and Idaho company for teaching the students flying, if they desire that work.

The start for modern Portland as an airplane manufacturing center came during the month of November, when the assembly plant of the Angeles Aeroplane Corp. was established at East Ninth and Marion streets in Sellwood. This company buys a small one-man machine known as a "Breezy" in the flying world, a machine which is designed to be within the reach of everyone's purse. The machines are of both the monoplane and biplane types.

Airplane Patents in Morocco

Although the life of a tourist is considered unsafe if he proceeds farther into Morocco than to the points at which the French blockade system assures protection, according to the New York Herald, transients received recently from the leg of surplus airmen, which have been sent by General Petain, say that there is a strong anti-aircraft effort.

It would require a standing army of 500,000 men to supervise properly every dangerous quarter in a country where religions as well as national ambitions are constantly conflicting. 250 sea air squadrons are efficiently covering the whole territory that in the last few years the number of attacks in the interior are understood to have decreased 90 per cent.

The work is not without its difficulties, however, for there are the wild tribes of nomads who have never in the past been managed to subdue their tribes and assassination in the hills, with the result that the airmen frequently return with their wings radiated with bullet holes. But these airmen rarely risk the attention of the public, and the French forces, despite casualties, are continuing their efforts to pacify the country which has never been subjected by a state.

Commander F. G. Eriksen's Home

On the cover of this issue is the Canadian home of F. G. Eriksen, the well known aeronautical engineer, at Victoria, Ontario, 22 miles west of Toronto. Mr. Eriksen's Flying Field adjoins his home and from here he operates to Toronto whenever he wishes to go to that city. Often he takes Mrs. Eriksen and their baby who is sixteen is the youngest flying passenger in aeronautics.



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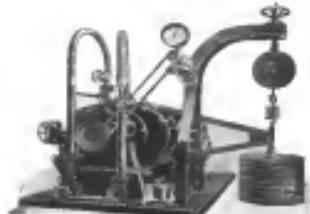
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